

MPS-HKUMed Patient Safety and Ethics Essay Prize

The Checklist Paradox:

“Never Events” on Surgical Safety Checklists that Continue to Happen

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Abstract

The WHO Surgical Safety Checklist was introduced to eliminate preventable surgical errors, yet Never Events persist globally despite high compliance. This essay examines two wrong-site craniotomies in Hong Kong's public hospitals to argue that checklist culture engenders a false sense of security by conflating completion with verification. Drawing on Reason's error taxonomy, research on surgical hierarchy, and institutional safety data, three mechanisms of failure are identified: cognitive automaticity, social power asymmetry, and institutional complacency driven by compliance metrics. The solution lies not in abandoning checklists but in reconceptualising them as prompts for active cognitive engagement rather than endpoints of verification.

There is a moment in every wrong-site surgery when the surgeon realizes.

In July 2017, a neurosurgeon at Princess Margaret Hospital drilled into the right side of an elderly man's skull to evacuate a haematoma and found, upon incising the dura, nothing: the clots were on the other side^{1,2}. Four months earlier, at Queen Elizabeth Hospital, another neurosurgeon had made an identical error, discovered only after the craniotomy was underway³. Both hospitals used mandatory Hospital Authority surgical safety checklists. Both teams had completed them^{1,2,3}.

In 2008, the WHO Surgical Safety Checklist was heralded as a breakthrough⁴. A landmark study in the New England Journal of Medicine reported a 47% reduction in mortality and a 36% reduction in complications across eight pilot hospitals worldwide⁵. The checklist was simple with nineteen items, three pause points, taking a few minutes at most. It pledged to eliminate "*Never Events*": preventable and inexcusable medical errors including wrong-site surgery, retained foreign objects, and wrong-patient procedures⁶. Health systems globally adopted it with rare enthusiasm.

Yet the Hong Kong cases are not anomalies. The NHS reports approximately 100 retained foreign object incidents annually^{7,8}, a figure that has remained stubbornly stable despite universal checklist adoption⁹. Wrong-site surgeries persist across healthcare systems globally¹⁰. A study of over 200,000 procedures across 101 Ontario hospitals, published in the same journal that announced the checklist, found no significant reduction in mortality or complications after mandatory implementation¹¹. The revolution, it seemed, had stalled.

This essay will argue that checklist culture risks engendering a false sense of security by conflating compliance with vigilance, paradoxically undermining the very attentiveness it was designed to promote. The solution lies not in abandoning checklists but in reconceptualising their function: shifting from a culture that treats completion as an endpoint to one that treats it as a prompt for active cognitive engagement.

What Checklists Do Well, and their Limits to Success

The case for checklists rests on the observation that modern medicine has become too complex for individual, unaided memory. The average ICU patient, for instance, requires 178 individual actions per day¹². By externalising memory, checklists ensure that routine steps are not skipped even under conditions of stress, fatigue, and time pressure. The WHO Surgical Safety Checklist is organised into three phases. ‘*Sign In*’, before anaesthesia, confirms patient identity, surgical site marking, and known allergies. ‘*Time Out*’, immediately before incision, pauses the entire team to verify the correct patient, procedure, and site. ‘*Sign Out*’, before the patient leaves the operating room, ensures instruments and swabs are counted, specimens labelled, and postoperative concerns communicated¹³.

Each phase targets a specific category of error. Surgeons already know to administer prophylactic antibiotics, to count swabs pre-closure, to verify patient identity; checklists ensure they reliably do. Subsequent studies have validated this: complications dropped from 11% to 7%, mortality from 1.5% to 0.8%; retained foreign objects declined when counts were mandated, antibiotic timing improved when prompts were introduced. These effects held in both high- and low-resource hospitals¹⁴.

The common thread: each success targeted errors of omission, where the clinician knew what to do but forgot or was too rushed to do it. For this category of failure, checklists work. But not all Never Events are errors of omission. Wrong-site and wrong-patient errors are often failures of perception or verification, where the surgeon believes he has the correct side, the team believes they have the correct patient. As “Confirm surgical site” is read aloud, the team simply confirms what they already believe. In other words, *checklists cannot intercept errors no one recognizes as occurring*.

Why Do Checklists Fail Beyond These Limits?

Understanding why requires looking beyond protocol design to the cognitive, social, and institutional contexts in which checklists operate.

The first mechanism is cognitive. Reason's taxonomy of human error distinguishes slips, where a correctly planned action is executed incorrectly because attention has shifted to automatic processing, from mistakes of planning¹⁵. Surgical checklists are especially vulnerable to the former: when a '*Time Out*' is performed hundreds of times without incident, its completion becomes decoupled from the cognitive work of conscious checking. In Hong Kong's overburdened public hospital system, where surgical teams work under sustained time pressure, the conditions for this decoupling are particularly acute¹⁶. At Princess Margaret Hospital, the operating team conducted '*Time Out*' correctly; yet thirty minutes later, the chief surgeon marked the incision on the wrong side of the skull, despite a correct site marking remaining visible on the patient's left ear lobe throughout¹⁷.

The second mechanism is social. The safety checklist is nominally a team tool, where the '*Time Out*' invites every member of the operating theatre to confirm the planned procedure. But surgical teams do not function as flat hierarchies: observational studies of communication in operating theatres found that communication failures were common across surgical exchanges, producing visible effects on team processes¹⁸. Makary et al. found a striking gap: surgeons rated collaboration with nurses far more favourably than nurses rated collaboration with surgeons¹⁹. These findings suggest that the checklist's core assumption, that a verbal prompt will produce genuine team-wide verification, misunderstands the social dynamics of the room it enters. Identifying a discrepancy requires a junior clinician or nurse to actively question a senior's stated plan, a social act that surgical hierarchy discourages and that checklist design does nothing to enable.

The third mechanism is institutional. In both Hong Kong cases – and in the overwhelming majority of surgical *Never Events* – the teams had complied. Their checklists had been completed. Checklist compliance globally is high, and institutions are quick to cite this as evidence that safety systems are working. But compliance measures completion, not verification. The errors that checklists cannot catch become invisible precisely *because* the compliance data looks reassuring. High completion rates fuel institutional complacency, as the checklist devolves from one tool within surgical safety to a proxy for safety culture itself. And when errors occur, blame falls disproportionately on surgeons. Incidents are framed as individual negligence – failures to follow protocol, lapses in concentration²⁰. This is not to excuse the surgical teams: the errors are real, so was the irreparable harm done. But framing *Never Events* as purely individual failures obscures the institutional conditions that enabled those errors. The checklist, having been completed, becomes evidence of the surgeon's fault rather than evidence of the system's limitation. A safety culture built on this logic does not learn; it punishes, and ensures the same conditions persist for the next team.

The Way Out

Treadwell et al.'s systematic review found that checklist compliance alone did not predict patient outcomes²¹. Instead, what mattered was the mode of engagement. This points toward a necessary shift from a culture which treats verification as a procedural event with a binary output, to a culture which treats safety as a distributed, ongoing process that continues up to the point of irreversible action.

But even a well-designed verification protocol fails if nobody in the room feels able to flag a discrepancy. Graded assertiveness frameworks such as the CUS model – Concerned, Uncomfortable, Safety issue – from TeamSTEPPS offer junior clinicians and nurses a scripted, legitimised escalation pathway that does not depend on individual courage to override surgical

hierarchy²². “Stop the line” policies, borrowed from manufacturing, grant any team member institutional authority to halt a procedure. These are meaningful reforms, but only if they are protected. In surgical culture, where deference to seniority runs deep, this work is both most necessary and most difficult, which is precisely why it cannot be delegated to a checkbox.

None of this will take root, however, if institutions continue to treat checklist completion rates as evidence that safety systems are working. Hospitals must stop measuring what is easy and start measuring what matters: audit the quality of *Time Outs* rather than simply whether they occurred; track near-miss reporting rates, a far better proxy for safety culture than compliance percentages; invest in simulation-based team training where wrong-site scenarios are deliberately introduced, building the pattern recognition and reflexes that no paper form provides. And when “Never Events” occur, respond with systems-level analysis rather than defaulting to individual blame – because as long as failure is treated as negligence rather than information, the institutional conditions that produce these errors will persist unchallenged.

Conclusion

There is a pattern in every wrong-site surgery investigation: the checklist was completed, the error occurred anyway, and the surgeon was blamed. This essay has argued that the pattern is not coincidental.

When safety is reduced to compliance, the checklist becomes both the system's defence and the individual's indictment – proof that the institution did its part and the surgeon did not. Breaking this cycle requires abandoning the comforting fiction that a completed form is a safe operation. Checklists remain essential, but they are tools, not talismans. The nineteen items on the WHO Surgical Safety Checklist can structure attention; they cannot replace it. Until institutions invest in the cognitive, social, and structural conditions that make genuine

verification possible, the checklist will continue to offer the appearance of safety while the conditions for the next *Never Event* remain quietly in place.

References

- [1] Cheung E. Hong Kong Brain Surgeon Drills Hole in wrong side of patient's head [Internet]. South China Morning Post. 2017 [cited 2026 Feb 24]. Available from: <https://www.scmp.com/news/hong-kong/health-environment/article/2102705/hong-kong-brain-surgeon-drills-hole-wrong-side>.
- [2] Princess Margaret Hospital announces root cause analysis investigation on sentinel event. Hospital Authority, The Government of the Hong Kong Special Administrative Region; 2017 [cited 2026]. Available from: <https://www.info.gov.hk/gia/general/201709/08/P2017090800775.htm>.
- [3] Leung C. Hong Kong Brain Surgeon operates on wrong side of patient's skull [Internet]. South China Morning Post. 2017 [cited 2026 Feb 24]. Available from: <https://www.scmp.com/news/hong-kong/health-environment/article/2077907/hong-kong-brain-surgeon-operates-wrong-side?module=inline&pgtype=article>.
- [4] World Health Organization. Implementation manual: WHO Surgical Safety Checklist (First edition) [Internet]. World Health Organization. 2008 [cited 2026 Feb 23]. Available from: <https://iris.who.int/handle/10665/70046>.
- [5] Haynes AB, Weiser TG, Berry WR, Lipsitz SR, Breizat A-HS, Dellinger EP, Herbosa T, Joseph S, Kibatala PL, Lapitan MC, Merry AF, Moorthy K, Reznick RK, Taylor B, Gawande AA. A surgical safety checklist to reduce morbidity and mortality in a global population. *New England Journal of Medicine*. 2009 Jan;360:491–499. .
- [6] Bowman CL, De Gorter R, Zaslow J, Fortier JH, Garber G. Identifying a list of healthcare 'never events' to effect system change: A systematic review and narrative synthesis. *BMJ Open Quality*. 2023 Jun;12. .

- [7] Bowman CL, De Gorter R, Zaslow J, Fortier JH, Garber G. Identifying a list of healthcare ‘never events’ to effect system change: A systematic review and narrative synthesis. *BMJ Open Quality*. 2023 Jun;12. .
- [8] NHS England. A provisional summary of Never Events that have been reported as occurring between 1 April to 31 December 2025. [Internet]. NHS England. NHS; 2026 [cited 2026 Feb 24]. Available from: <https://www.england.nhs.uk/long-read/provisional-publication-of-never-events-reported-as-occurring-between-april-2025-and-july-2025/>.
- [9] NHS England. A provisional summary of Never Events that have been reported as occurring between 1 April 2024 and 30 March 2025. [Internet]. NHS England. NHS; 2025 [cited 2026 Feb 24]. Available from: <https://www.england.nhs.uk/statistics/statistical-work-areas/patient-safety-data/2024-25/>.
- [10] Parmar D, Patel N, Kenneth-Ogah C, Yazdouni S, Desai C, Raveshia D, Patel R. Root causes of surgical never-events: A systematic review. *Patient Safety in Surgery*. 2026 Jan;20. .
- [11] Urbach DR, Govindarajan A, Saskin R, Wilton AS, Baxter NN. Introduction of Surgical Safety Checklists in Ontario, Canada. *New England Journal of Medicine*. 2014 Mar;370:1029–1038. .
- [12] Gawande A. *The Checklist Manifesto: How to Get Things Right*. New York: Metropolitan Books; 2009.
- [13] World Health Organization. WHO guidelines for safe surgery 2009: safe surgery saves lives. Geneva: World Health Organization; 2009. Available from: <https://www.who.int/publications/i/item/9789241598552>.

- [14] Borchard A, Schwappach DLB, Barbir A, Bezzola P. A systematic review of the effectiveness, compliance, and critical factors for implementation of safety checklists in surgery. *Annals of Surgery*. 2012;256(6):925–933.
- [15] Reason J. *Human Error*. Cambridge: Cambridge University Press; 1990.
- [16] Hospital Authority. *Hospital Authority Annual Report 2016–2017*. Hong Kong: Hospital Authority; 2017.
- [17] Princess Margaret Hospital announces root cause analysis investigation on sentinel event. Hospital Authority, The Government of the Hong Kong Special Administrative Region; 2017 [cited 2026]. Available from:
<https://www.info.gov.hk/gia/general/201709/08/P2017090800775.htm>.
- [18] Lingard L, Espin S, Whyte S, Regehr G, Baker GR, Reznick R, et al. Communication failures in the operating room: an observational classification of recurrent types and effects. *Quality and Safety in Health Care*. 2004;13(5):330–334.
- [19] Makary MA, Sexton JB, Freischlag JA, Holzmueller CG, Millman EA, Rowen L, et al. Operating room teamwork among physicians and nurses: teamwork in the eye of the beholder. *Journal of the American College of Surgeons*. 2006;202(5):746–752.
- [20] Dekker S. *Just Culture: Balancing Safety and Accountability*. 2nd ed. Boca Raton: CRC Press; 2012.
- [21] Treadwell JR, Lucas S, Tsou AY. Surgical checklists: a systematic review of impacts and implementation. *BMJ Quality & Safety*. 2014;23(4):299–318.
- [22] King HB, Battles J, Baker DP, Alonso A, Salas E, Webster J, et al. TeamSTEPPS™: Team Strategies and Tools to Enhance Performance and Patient Safety. In: Henriksen K, Battles JB, Keyes MA, Grady ML, editors. *Advances in Patient Safety: New Directions and Alternative Approaches*. Rockville: Agency for Healthcare Research and Quality; 2008.